Based on our studies, we detail here some strategies for loop build out which are part of the typical business expansion strategy of a CLEC:

Frequently, loop build-out is driven by data services, because such services are generally high value to customers and consequently high revenue producing to providers. The general belief among the larger facilities-based CLECs is that data services can provide a significant revenue-generating entry vehicle into a new territory with limited risk and capital outlay. Once the target area begins to generate sufficient revenues, other services, including voice, can be added to the CLEC's portfolio in that area.

Loop build-out in connection with this popular method of entry can be facilitated by several approaches:

"Long loops" is one method in use in the marketplace. It is an arrangement whereby a CLEC uses an ILEC or another CLEC to obtain a connection from a remote customer premises to its distant POP. Whether CLECs or ILECs are utilized, the cost is comparatively greater than some other options, as the arrangement involves two channel terminations and, in the case of dedicated circuits, a recurring charge which needs to be passed on to the customer. Long loops are an interim and relatively expensive mechanism. They make sense, or don't, depending on the attractiveness of that particular customer to the CLEC, and the CLEC's willingness either to accept a low profit or perhaps none at all, to establish its presence in a particular location before it has the economic justification to build significant facilities of its own. It is an arrangement used on a case by case basis.

"Virtual POPs" is another method in significant use. This is an arrangement made by one CLEC with another CLEC, which we have seen applied to end user T1/DS1 bandwidth needs, such as for private line and frame relay services. The CLEC wishing to enter the area via a virtual POP provisions one or more DS3s to another CLEC's POP. The DS3 is broken down via muxes into component T1s which are then offered to retail customers over lines provided by the second CLEC. Customers pay for one channel termination and any distance sensitive charging is limited to the customer-

premise-to-virtual-POP segment. The virtual POP scenario has technical limitations. Generally, the virtual POP cannot be more than 30 miles from the requesting CLEC's POP. There must also be perceived to be a significant market opportunity for the requesting CLEC. When a service such as frame relay is provided, there is frequently a need to install DACS to permit the circuits to reconfigure at lower levels of capacity. Here again, regulatory requirements imposed on ILECs would produce virtually nothing for the CLECs of practical value. Most of these arrangements that we have learned about are handled pursuant to cooperative, long term facilities swaps, in lieu of direct payments. It is an example of the market operating as the mother of invention, circumventing collocation and UNE costs entirely.

Still another method of local entry is through NNIs (network to network interface), at least for frame relay, and possibly soon for ATM-based services. NNIs are most easily thought of as contractual standards. Signatories to an NNI can provision truly transparent services to cutomers connected to either network. In a dramatic example of the use of NNIs, one CLEC, Intermedia, is able to reach customers in nearly 80% of the United States through its over 600 NNI agreements with other carriers of all descriptions.

Nextlink provides a good example of other methods available and being utilized to achieve access to the end user:

> "We currently use both direct connections from our fiber network to buildings in the central business district as well as leased unbundle loop lines from the ILEC to connect off-network customers to our network (commonly referred to as the "last mile" to the customer). For off-network buildings, we are also developing alternative means for establishing transport that links our end users to our network through the use of a radio service, generally called local multipoint distribution service, or LMDS. LMDS is a newly authorized fixed broadband point-to-multipoint radio service, which the license holder may deploy for wireless local loop telephony, mobile wireless backhaul services, high-

speed data transfer, video broadcasting and video oconferencing, in any combination. We control or have rights to acquire LMDS wireless spectrum covering 95% of the persons located within the licensed areas, or POPs, in the 30 largest markets in the United States which, if the acquisition is consummated, will make us the largest holder of LMDS wireless spectrum in North America." Nextlink 1998 10K.

Evolution of circuit-switched network

There are several developments taking place in the ILEC transmission plant which have implications for this proceeding: (1) the spread of digital loop carriers (DLC), (2) the emergence of xDSL modems and (3) the placement of DSLAMs.

The FCC's unbundling determination in this proceeding could very easily have significant impact on how, at what speed, or even whether these advanced technologies -- which facilitate mass market access to the newest generation of broadband services -- get deployed.

To begin, at the time of the 1996 order, only about 10% of local loops utilized DLC. Thus, for 90% of the cases, the unbundling of the local loop was a simple matter of tracing a copper pair from a customer premises to an ILEC central office where it could be physically connected severed and fed to a requesting CLEC. Today, that process is much more complicated as the former discrete copper loops have become virtual loops. The added administrative complications of provisioning, maintaining and repairing a virtual loop are significant. These issues must be addressed in an economically rational manner.

The difficulty created by DLC is about to be further compounded by the fact that DSLAMs, the vehicle for disaggregating voice and data traffic, are emerging from their central office locations and finding their way into the DLC.

XDSL has become a highly attractive and competitive business.[34] Quite realistically, it is a competitive business which could be adversely impacted in its current form by an xDSL UNE requirement being imposed on ILECs. This is because imposed unbundling of ILEC xDSL offerings could very easily increase CLEC investment risk in alternative xDSL investment, adversely impact demand for the facilities/services of the new carriers focused on xDSL and decrease the rents potentially available from innovation.[35]

Geographical considerations

Given the vast alternative loop infrastructure already available in many metropolitan areas, it is a legitimate issue to consider whether there is an economic justification for requiring unbundled local loops in every area.

Other jurisdictions have considered this question. Canada has analyzed this question in detail and determined that the answer should be no.[36] Even CLECS recognize the need for geographic market focus. As Colt recently told OFTEL in the U.K:

> "We...suggest that OFTEL recognises that competition has reached different stages in different (relatively small) geographic markets. Markets such as the City of London are highly competitive for the provision of higher bandwidth and the imposition of UK-wide blanket regulation that would affect competitive markets, in our view, would bring no benefits to consumers and is likely to lead to regulatory-driven market distortions."

34/ E.g., ICG 1998 10K: "The Company expects to offer DSL in over 400 central offices by the end of 1999 through alliances with other companies focusing on DSL service."

35/ Debates on these very issues have been engaged in France, the UK and Ireland, in precisely these terms of reference.

36/ In 1995 the Canadian CRTC applied an "essential facilities" test and determined that local loops were not essential in lower rate band areas (i.e., generally central business districts) and thus did not have to be unbundled.

The rationale for Colt expressing such a view is obvious. A local loop UNE detracts from the value of alternative loop construction.

2. NIDs

Facilities-based carriers deploying their own loops find it beneficial to provide their own NIDs for quality purposes. We are aware of no market evidence that entrants require access to the ILEC NIDs.

In a 1998 study for a foreign telephone company conducting a benchmarking test on repair and maintenance procedures, our firm studied in detail three cooperating American ILECs. This study revealed that the NID is rapidly becoming a integral part of a carrier's network quality control process. The modern NID is a "smart" fault location device containing diagnostic computer chips which communicate remotely to the carrier's testing centers. They are an efficient means of distinguishing between customer problems and network problems.

3. switching[37]

Our work over the last year and one half has found no actual significant market demand for the switching UNE -- period. Not only is ILEC switching not useful to CLECs, it is not used.[38]

37/ Although the NPRM references "local switching," the actual FCC decision included tandem switching as well, and we assume here that the FCC has not yet abandoned the tandem unbundling requirement.

38/ David Gonzales, Director of Regulatory Affairs at Nextlink, stating that local exchange service competition has developed significantly since the FCC developed the UNE list, acknowledged that it is a "legitimate question" whether switching should be listed as a UNE. TR Reports, February 15, 1999.

Almost invariably, facilities-based CLECs provide their own switching, even when utilizing unbundling and collocation.[39]

In addition to the overwhelming evidence that voice switches have proliferated among entrants, market evidence also indicates that voice switches are rapidly being replaced in the market by data technologies and thus are increasingly becoming less and less relevant to entrants, and even to some incumbents. The most dramatic proof of this fact is the recent announcement by AT&T that it would stop procuring

---

39/ As one CLEC described in SEC filings: "Allegiance is developing its networks throughout the United States using what it refers to as a "smart build" approach. In contrast to the traditional network build-out strategy under which carriers install their own telecommunications switch in each market and then construct their own fiber optic networks to reach customers, Allegiance installs its own switch in each market but then leases other elements of the network from the ILECs. The smart-build strategy specifically involves:

- - leasing existing ILEC copper wire connections throughout a local market area, also called the "local loop," which connect customers to the central offices or "hubs" of an ILEC network, and

- - installing, or physically locating, transmission equipment in these central offices to route customer traffic through them to Allegiance's own switch.

"Locating equipment at ILEC facilities, also known as "collocation," is central to the success of the smart build strategy. By collocating, Allegiance has the ability to lease, on a monthly or long-term basis, local loop and other network elements owned by the ILEC. This enables Allegiance to reach a wide range of customers without having to build network connections to each one of them…..

"Once traffic volume growth justifies further capital investment, Allegiance may lease unused fiber to which Allegiance adds its own electronic transmission equipment. This fiber is known as "dark fiber" because no light is transmitted through it while it is unused.

"Allegiance believes that dark fiber is readily available in most major markets." Allegiance S-1 1998.

voice switches entirely by the end of this year.[40] AT&T's Frank Ianna compared the significance of AT&T's move away from the circuit-switched network as every bit as significant as the adoption of digital technology - the "next generation architecture."

There is nothing surprising in the lack of interest in ILEC unbundled switching. It is a reality very much in evidence in European markets as well. In Europe, trunk side interconnection is available as part of any standard carrier interconnection negotiations. This interconnection framework has produced no major issues. If switching were essential, or desired, by competitors there would be complaints about the limitation on available interconnection services as not including switching.

4. interoffice transmission facilities

The major metropolitan areas of the United States virtually all have multiple infrastructure facilities of fiber and fiber-based rings, there are multiple infrastructures between virtually all the metropolitan areas, and most CLECs construct their own facilities as soon as feasible.[41]

40/ AT&T's Embrace of the New Technology Signals Next Era," New York Times, March 8, 1999, p. B1

41/ Indeed, there is even a growing CLEC market in providing such transport as a service: "The Network Services product consists of point-to-point dedicated services that provide a private transmission channel for our customer's exclusive use between two or more locations. This product line is offered in both local MAN and long-haul applications. Local MAN services are provided over the SONET networks that the Company has built in each of its MAN cities. Dedicated point-to-point and multiplexed services are provided from DS-0 to OC-48 transmission levels over protected routes to our on-net locations." Electric Lightwave 1998 10K.

See also, Allegiance S-1 for an example of build-out strategy: "Once traffic volume growth justifies further capital investment, Allegiance may lease unused fiber to which Allegiance adds its own electronic transmission equipment. This fiber is known as "dark fiber" because no light is transmitted through it while it is unused. Allegiance believes that dark fiber is readily available in most major markets…..

City to city transport networks are being built many times over and is available from many companies, including such new intercity carriers such as Qwest, Williams, IXC, Agis, and Frontier. Substantial additional facilities are planned and under construction, much of it utilizing advanced transmission architectures which transmit directly over DWDM[42], and reach bandwidth densities previously unmatched.[43]

In addition, within metropolitan regions, competitive metropolitan area networks, including fiber rings, exist in virtually all the major metropolitan areas and in many secondary and tertiary metropolitan areas as well. For example, Metromedia is a company whose business consists virtually entirely of building ring capacity for other carriers, and connections between cities. These rings and city to city connecting links utilize SONET-based fiber with capacities up to OC-192. The company is already active New York, Los Angeles, San Francisco, Philadelphia, Washington, D.C., Boston, Baltimore, and Chicago with plans for many other metropolitan areas.

Most importantly, our survey for New Entrant uncovered no significant use of ILEC facilities for interoffice

---

"Allegiance is moving to the next stage of its smart build strategy in New York City and Dallas by entering into leases for dark fiber to which Allegiance is installing its own electronic equipment. These leases are accounted for as capital leases. In New York City, Allegiance has entered into an agreement to lease three rings of dark fiber in Manhattan with an extension into Brooklyn. In the Dallas market, Allegiance has reached an agreement to lease one ring of dark fiber in Dallas County. Allegiance anticipates that any future dark fiber leases will have roughly similar terms and conditions and therefore it is likely that such additional dark fiber leases, if any, will also be accounted for as capital leases."

42/ For example, Frontier's "Optronics Network" is using Ascend GX 550 ATM switches to transmit directly over DWDM, eliminating a layer of transmission equipment.

43/ Frontier is installing a 32 channel Perilli TeraMux Hypr-Dense WDM system to create network "express lanes" @ 1,28 terabits ps, scalable to 128 channels at OC 192 Capacity - 10 Gps per channel. This network is connecting 20 metropolitan areas. Level 3 is installing similar technology.

transport of CLEC network traffic. In conducting our survey, New Entrant wished to know what facilities were directly owned by the interviewed company and what facilities were acquired from other carriers. CLECs invariably took great pains to emphasize their control and direct quality assurance responsibility for the facilities and services they were proposing to be offered to New Entrant.

The most likely usefulness of interoffice transmission would appear to be in less dense geographies where CLECs might wish to establish a network "spur" to serve a few clients but as to which there is not sufficient perceived demand to justify CLEC network build-out. Thus any UNE finding in this area might conceivably be based upon some geography-specific market failure. Of further relevance to this issue is the discussion of loop build-out strategies, such as long loops and virtual POPs, discussed infra.

Also relevant is that the few requests for interoffice transport of which we are aware have been handled successfully through larger interconnection negotiations between carriers.

There is also an active sub-market for carrying interoffice traffic.[44]

5. signaling networks and call related data bases

SS7-based networks have well established, standardized means of exchanging necessary call-related information between them. Here again, we are aware of no market evidence that these systems are being utilized. Although a requirement for ISDN, ISDN technology is simply not at the forefront of

---

44/ For example, ICG has entered this specific market: "As part of its initial 'carrier's carrier' strategy, the Company targeted the transport between long distance company facilities and the local telephone company central offices, and, for high volume customers, between the long distance company and the end user customer's office. In order to leverage its significant network investment, the Company also markets these services directly to end user business customers." 1998 10K.

today's most advanced and competitive service offerings, as it may have been perceived in 1996. Our surveys do not find ISDN to be an important service offering of the major CLECs.

Although our inquiries have shown that these services are generally self-provisioned, we are aware that there are available alternatives to ILEC SS7 capabilities available on a wholesale basis.[45]

6. Operations support systems

The experience of the last three years has demonstrated that efficient competitive carriers do not need to rely on incumbent OSS functions. In fact, competitors have found that customized OSSs can provide a competitive edge.[46] As a

---

45/ The CLEC ICG is one such example. Its most current 10K describes both the general market conditions of self-provision and its own provisioning of signaling on a wholesale basis to others: "The Company's Signaling System7 ("SS7") services provide signaling connections between long distance and local exchange carriers, and between long distance carriers' networks. SS7, sometimes referred to as "look-ahead routing," is used by local exchange companies, long distance carriers, wireless carriers and others to signal between network elements, creating faster call set-up and resulting in more efficient use of network resources. SS7 is now the standard method for telecommunications signaling worldwide. The Company has deployed signal transfer points ("STPs") throughout its networks to efficiently route SS7 data across the United States. SS7 is also the enabling technology for advanced intelligence network platforms, a set of services and signaling options that carriers can use to create new services or customer options. Carriers purchase connections into the Company's SS7 network, and also purchase connections to other local and long distance carriers on a monthly recurring basis. The Company has also developed a nationwide SS7 service with Southern New England Telecommunications Corporation ("SNET"), a subsidiary of SBC Communications, Inc. The Company believes that, together with SNET, it is one of the largest independent suppliers of SS7 services. The Company's STPs are integrated with two SNET "gateway" STPs in Connecticut."

46/ A typical comment from a CLEC: "Allegiance has developed procedures, together with its back office systems vendors, MetaSolv, DSET, Lucent and Intertech, that it believes will provide it with a significant competitive advantage in terms of reducing costs, processing large order volumes and providing customer service. Back office systems enable a phone company to enter, schedule and track a customer's order from the point of sale to the installation and testing of service. These systems also include or interface with trouble management, inventory, billing, collection and customer service systems." Allegiance SEC Form S-1, 1998.

result, a very important market has developed focused on supplying customized OSS products which permit carriers to distinguish themselves in the marketplace. Customized OSS systems, available from a growing number of vendors such as Metasolv, Visionael, Remedy, Northern Telecom, Lucent, and others are serving such varied functions as:

merging facilities information in different data bases for preordering purposes, such as knowing all owned and leased facilities inventory, collocations, on-net buildings and availability dates for new construction;

merging information about services availability, such as capabilities of voice and data switches/routers

understanding availability of key internal resources such as order processing and billing, installation availability, other customer support;

coordinating any joint service provisioning with another carrier;

designing the routing paths for customer traffic, including such customized features as least call routing;

customized billing capabilities;

network monitoring, repair and maintenance tracking; and

Another example is an April 1999 press release of ICG: "CLEC firm ICG Communications of Englewood, Colo., has activated new customer care and billing systems developed by IBM that initially will process billing data and customer inquiries along its Colorado network facilities. Previously ICG used an outsourcing firm to handle its billing needs. ICG plans to extend the reach of its new OSS systems into all nine states it currently serves by the end of the year."

tools providing cost inputs for calculating customized pricing options.

We have surveyed the use of OSSs among major new carriers and have found very little reliance upon the OSS systems of ILECs. Rather, CLECs procure OSSs which are customized to the carrier's particular markets, target customers, network design, etc. This strategy enables the CLEC to compete upon the basis of its own high quality repair, maintenance, and other services.

Advanced OSS systems can usefully communicate to one another electronically, of course. In fact, the evolution and emergence of OSSs as a point of market differentiation has impacted Telecommunications Managed Network (TMN) standards. These standards not only permit carriers to interface with each other, but they allow sophisticated customers to interface with the carrier OSSs to track orders, billing and trouble reports. In fact, the market model which is developing is one of multiple competitors with proprietary OSSs desiring compatible interfaces with ILECs and all other carriers with which they interact. A set of industry committees under the rubric Alliance for Telecommunications Industry Solutions is seeking to facilitate just that objective.

Electronic interfaces between independent OSSs is something different from the concept of an unbundled network element. Furthermore, electronic interfaces, no matter what the FCC chooses to call them, are only relevant to the largest and most sophisticated CLECs. Many CLECs are not large enough to utilize electronic interfaces. Instead, they have developed with ILECs systems for autofaxing orders, or manually faxing orders on printed forms, making pre-ordering inquiries, number assignments, tracking billing and processing trouble reports through manual or web-based processes.

There is also evidence to suggest that market forces are operating to influence and spur the development of OSS information flow between local services competitors -- based upon a mutual desire to minimize transaction costs. For example, we are aware from our study interviews of at least

one ILEC which is undertaking on its own initiative the development of testing systems for use by CLECs so as to reduce the time and effort required of its employees with respect to trouble reports involving unbundled loops.

7. operator services and directory assistance

We have had very little experience researching this particular UNE and thus will offer no analysis or comment other than that there are a myriad of alternative sources of operator services and directory assistance currently in the marketplace.

UNEs and Resale

The NPRM requests comment on "the extent to which, if any[sic], the availability of resold services obtained from the incumbent LEC should be considered in determining whether a particular network element should be unbundled."

The bundled UNE-platform made a part of the 1996 FCC decision is resale of local service under a pricing formula different from the formula set out in the Act. Thus, the FCC has already related these two forms of entry. There is substantial question whether forced resale can help achieve an effective competitive sector or promote the diffusion of advanced services. Two factors should be considered: First, forced resale has not played a significant role in the development of facilities-based CLECs nor, as far as we know, have major resale oriented new players developed on the scene. Second, there is substantial concern recognized by many jurisdictions that forced resale may retard the deployment of advanced infrastructure.

Soon after the passage of the Act, many newly entering CLECs, and perhaps even most existing CLECs not associated with long distance companies, attempted to expand their customer base by engaging in the resale of ILEC dialtone. There were three major approaches and motivations. Some, such as Access One and USN Communications Inc., sought to make resale of local service their core business. Others

were attempting through resale to deliver a promise of providing a customer with a consolidated single bill that covered all the major telecom services, such as long distance, local and Internet access. Frontier, in its role as a CLEC, is a good example of this second category. Still other CLECs approached resale as a way to get brand recognition as a local provider while they planned or built their own switched network. Allegiance is a good example of this third major category.[47]

Since that beginning, there has been a general shift away from resale by most of the facilities-based carriers. The CLEC industry has invested in its own OSS, customer service, billing platforms, etc. and has found that the on-net customer can be provided a much higher quality of service than the resold customer.

A resold ILEC dialtone is 100% off-net and requires a great deal of precise information flow to the ILEC at the time the service is ordered. The turn-up of the service is dependent upon ILEC facilities and resources. In addition, when there is a service problem it cannot be viewed by the CLEC's Network Operations Center and requires back and forth communications to restore service. The practical reality is that one needs one's own central office switch or data switch to provide a competitive quality product to the end customer. Resale's most secure marketplace function appears limited to adding off-net locations to an on-net customer's bill, or in the business of providing retail agency for ILEC services.

From a market perspective, whatever forced resale's policy benefits, it primarily shifts market share percentages of service on the legacy infrastructure from the ILEC to a new brand. The billing brand may change but the underlying network is still the ILEC's.

47/ A fourth category of CLECs, long distance carriers, possess conflicting interests, namely, the desire to keep ILECs out of their core long distance business, a factor which distorts and complicates their usefulness as a market indicator in this area.

To be sure, resale can provide meaningful competition in some respects and its role in fostering competition is soundly entrenched in economic literature. In theory, resale could stimulate the market. We do not know whether that is the case here as we have seen no substantial data on the subject. However, most of the world has come to the conclusion that promoting telecommunications resale distracts from the goal of encouraging investment in advanced infrastructure. See, e.g., Canada[48] and EC Directives.[49]

All of these considerations are equally applicable to a UNE strategy. The view that true facility-based competition is the most meaningful competition for the telecommunications market of today is not entirely a "foreign" view. It appears to be the view of the United States Department of Justice.[50]

48/ "If the definition of essential facilities is too broad, giving overly generous access to ILEC inputs, CLECs may not have sufficient incentives to invest in their own facilities, and would enter and remain in the market primarily as resellers. The Commission is of the view that efficient and effective competition will be best achieved through facilities-based competitive service providers; otherwise, competition will only develop at the retail level, with the ILECs retaining monopoly control of wholesale level distribution." CRTC Local Competition Decision. 1997.

49/ In its Recommendation on Interconnection, C(97) 3148 the EC endorsed the notion that member states may link interconnection conditions to the level of investment in infrastructure so long as it was done in a manner which did "not lead to any restriction of distortion on competition."

50/ Speaking at the American Bar Association, Antitrust Section Spring Meeting, Assistant Attorney General Joel Klein stated that meaningful local competition requires the introduction of "alternative technologies."

It appears to be the view of Wall Street.[51] It is a view shared by at least some members of the CLEC industry.[52]

Another aspect of the resale issue that is important here is that the nature and character of resale which obtains in a competitive marketplace is likely to be very different from the form of resale which may obtain as part of a particular regulatory mandate.

Resale is a common feature of most industry sectors. However, it is normally found as a voluntary vertical relationship entered into by mutual consent and motivated by the expectations of both supplier and reseller that the arrangement will result in mutual gain. Resale which is forced upon the market by regulation is unlikely to have the same impacts as it would in a market in which resale is relatively regulation free. As a result, the Commission must thoroughly examine and have some understanding of the impacts any forced resale scheme may have on competition and, more generally, social welfare. Since 1996 resale of local

---

51/ Representative examples of this widespread and dominant view are the following: In a recent interview Eric Strumingher, First Vice President, Paine Webber, Inc.'s telecommunications research group, compared the prospects of AT&T and MCI WorldCom: "*Q. MCI WorldCom is moving forward with plans to mass market services in New York using a UNE platform. Does that model represent a more cost-efficient platform than cable telephony?* A. No, I think that AT&T long term will have a lower cost structure and also the ability to be an innovator in serviceofferings and service delivery because of that - because it actually owns the assets as oposed to relying on the Bell company." TR Reports, March 8, 1999, page 46.

Another example is that the recent e.spire sale of 15,000 unbundled BellSouth loops to Access One (which is discussed later in this section in some detail) was reported to be motivated by an effort to improve its standing with the financial community. As one report stated: "The Company has been criticized in the past by financial analysts for having too high a percentage of its lines 'off-net.'" Phone+, posted April 20, 1999.

52/ Winstar CEO Bill Rouhanna stated: "First and foremost, I really do think we need alternate facilities. I don't believe that resale or the use of the Bell company facilities truly creates the environment that was intended by the Act. It doesn't stimulate the kind of competition that brings innovative services to consumers. It takes maximum advantage of technology." March 4, 1998 testimony, supra.

service has not emerged as an important stand alone long run business opportunity for larger competitors.

International Regulation of Unbundling Is Grounded in Economic Analysis Informed by Market Evidence

The 1996 order here being reconsidered was based upon technical feasibility. Everywhere else in the developed world the issue of unbundling is based upon an economic analysis of real world market conditions, and in every case, the focus of attention becomes whether there is a market failure caused by the power of dominant players. As this section discusses, only upon showing of a market failure does the regulator intervene.

There is good reason for this. Regulatory intervention is not without cost. It can skew investment incentives. It can create its own set of barriers to entry. It can facilitate the entry of inefficient competition.

What is more, there is general acceptance among both incumbents and entrants that basing regulation on market failure findings is the proper, objective focus for debate likely to yield rational, predictive results. To give an example, Colt is one of Europe's largest and most aggressive CLECs. In connection with the current renewed U.K. inquiry into unbundling, its position is stated as follows:

"We…suggest that the following approach is considered:

* Regulation is only appropriate where there is market failure;
* OFTEL must clearly define the market in which they wish to promote competition, which in this case consists of a number of geographic areas and not the UK as a whole;
* OFTEL must carefully assess market power and be aware of the supply-side substitutes:
* cable TV operators;
* competitive access providers;
* wireless local loop (particularly if further frequency ranges are made available);

* mobile (particularly UMTS); and
* power-line access providers;
* therefore in many areas the market is competitive;
* if the market is competitive no regulation is required."

There is an evident global "best practices" approach to unbundling regulation which we have been required to review on behalf of several clients and which we suggest provides useful insight to the task currently facing the Commission.

The European Commission

Under EC law, unbundling falls within the larger subject of interconnection and ONP.[53] As such, the basis for regulation is necessarily grounded in an assessment of market failure resulting from dominance or "SMP" -- significant market power, the exercise of which would adversely impact interoperability of network services or the development of competition.[54]

The European Commission has expressed its own analysis framework as follows:

"40. Firms are subject to three main sources of competitive constraints; demand substitutability, supply substitutability and potential competition, with the first constituting the most immediate and effective disciplinary force on the suppliers of a given product or service. Demand substitutability

---

53/ See, the European directives with regard to ONP leased lines (92/44/EC, Official Journal L 165/27 dated 19 June 1992 amended by 97/51/EC, Official Journal L 295/23 dated 29 October 1997) (henceforth referred to as 'the leased line directive'), ONP voice telephony (98/10/EC, Official Journal L 101/24 dated 1 April 1998) and Interconnection (97/33/EC, Official Journal L 199/32 dated 26 July 1997 amended by 98/61/EC, Official Journal L 268/37 dated 3 October 1998).

54/ Generally, the EC Directives encourage a multiple layered economics assessment which gives as broad and accurate view of actual marketplace conditions as possible, including demand substitutability, supply substitutability, and potential competition with respect to both end user services and the network infrastructure used to provide end user services.

is therefore the main tool used to define the relevant product market on which restrictions of competition for the purposes of Articles 85(1) and 86 can be identified.

"41. Supply substitutability may in appropriate circumstances be used as a complementary element to define relevant markets. In practice it cannot clearly distinguished from potential competition. Supply side substitutability and potential competition are used for the purpose of determining whether the undertaking has a dominant position or whether the restriction of competition is significant within the meaning of Article 85, or whether there is elimination of competition."[55]

The EC goes on to point out the importance of assessing both short term and long term market developments.

The EC has not required any unbundling. It has left the market assessments entirely to the individual member states for analysis of their own conditions. These individual assessments are also instructive. The demand focus has focused virtually exclusively on loop unbundling.

The United Kingdom

OFTEL's approach to unbundling relies first and foremost on the principles of competition law, supplemented by sector-specific rules which are demonstrated to be necessary to protect consumer interests in "advance of an abuse of a dominant position." Such rules are to be "based on standard competition analysis which carefully weighs the prospects for competition in the relevant market and related markets with and without intervention."[56]

55/ Notice on the Application of the Competitive Rules to Access Agreements in the Telecommunications Sector. 1998.

56/ OFTEL December 1998 discussion paper on Unbundling.

OFTEL is currently considering unbundling for the second time. It rejected unbundling in 1995 for lack of market interest:

> "In 1995, OFTEL looked at the issue of LLU [*local loop unbundling*] for basic telephony (no-one was, of course, talking about mass market Internet or video services at that time). This consultation considered whether to require BT to develop and offer access services. However competing operators showed no interest."[57]

It has reopened consideration of unbundling again as of December 1998 but again it has only found reason to consider loop unbundling (and associated collocation).

One of the more notable submissions in terms of presenting market analysis has been that of Cable and Wireless, which made the following observations about the developing competitive market in the U.K. for broadband service provisioning:

> "On the supply-side, there is no clear evidence that in the future the market for broadband access will not be adequately served. There are a number of alternative infrastructures that could potentially compete in the provision of higher bandwidth services, not only to corporate customers but also to consumers and small businesses:
>
> - cable: within the next two years, broadband cable will be available to around 60-70% of UK residents. The three major networks will carry digital services, including high bandwidth interactive services, using cable modem technologies;
> - GSM mobile: GSM networks currently provide national coverage and ongoing upgrades are improving the bandwidth available for mobile data services;

57/ Ibid.

- UMTS: the UMTS licensing process will potentially introduce five new access providers, all of whom will be able to support full mobile broadband services;
- satellite: digital broadband services are being provided throughout the UK with interactive services, using a PSTN return path, due within months. New broadband satellite networks are already being put into orbit and will be providing broadband data services across the globe, as demand develops;
fixed radio links: fixed radio spectrum is available nationally, including spectrum allocated for point-to-multipoint service provision. This spectrum remains a valuable component for a competitive communications market.

Given these factors, Cable & Wireless Communications believes that OFTEL should proceed with caution when assessing the need for market intervention."

A relatively new U.K. competitor, FirstMark, which is testing wireless loop provisioning in France and Belgium, has evidenced an interesting, if self-interested, frankness about the impact of regulation on investment and the development of competition:

"Effective long-term competition is only achieved if an operator needs to recoup its investment. Resellers and non-facilities based telecommunications operators simply drive the price of services down by exploiting short-term arbitrage opportunities and do not inspire innovation or customer loyalty. Further, the practical realities of relying on BT for various parts of the local loop (in cases of complete or partial unbundling) implies that it will take a number of years for alternative operators to successfully offer DSL-based high-bandwidth access."

France

One of the major competitive carriers has informed ART, the French regulator, that it has requested local loop unbundling from France Telecom in their interconnection negotiations. However, at this point, that carrier, Cegetel, is still considering whether such unbundling is something they will utilize economically in their own infrastructure build-out, or whether they would rather obtain a local access service from France Telecom in lieu of unbundled facilities.[58] ART, for its part, has requested advisory input on the unbundling issue from a consulting body which has focused its analysis on investment impacts and other market and economic considerations.

The Netherlands

The Netherlands required loop unbundling in December 1997 and recently confirmed that requirement and put into place a regulated pricing structure with a five year automatic sunset provision. OPTA's discussion of the market/economic touchstone for its regulatory analysis is particularly evident in its most recent decision:

> "As discussed in § 8, the Commission considers it important that more competition develops in the product markets for local telecommunication services, such as internet access, as well as in the markets for innovative, in particular broadband, telecommunication services. The charges paid by competitors for a local line should therefore, in principle be the same as the charges KPN Telecom pays, i.e., recovers for the use of that part of the local connection from the end users.
>
> "30. On the other hand, the Commission recognises that the development of alternative access networks

---

58/ In the context of such interconnection negotiations, there is some obligation to utilize the unbundled elements.

is, at present, in its infancy. In a more mature market, a provider requiring the use of such networks would rather pay charges in line with a valuation on the basis of current costs, as is also the case with the valuation method of the EDC-model for the core network. The effective competition between access networks should, in such a market, not be impeded by potential differences in (regulated) cost allocation methods and valuation principles.

"31. The Commission is of the opinion that a gradual transition period from, in brief, a tariff based on historical costs to a tariff based on current costs, does justice to both the early stages of development of competition at present and the further development of competition in coming years. The Commission determines the transition period to be five years. After this period, KPN Telecom is, in principle, free to set the tariff on a commercial basis. The time period is based on the following considerations. A term of five years is considered to be representative for the minimum period in which to earn a return on (initial) investments for new services in a capital intensive industry such as the telecommunications industry. In mobile telephony, for instance, the break-even point is reached, on average, after the third of fourth year of operation. More in general, a period of five years is not unusual in view of earning a return on certain investments, for instance, in facilities in leased premises. Furthermore, reference can be made to Canadian legislation, in which a period of five years is considered sufficient to, on the one hand, stimulate innovative access and, on the other hand, to activate market parties to install their own facilities in due time or acquire these in another way. Finally, the Commission points out that wireless broadband networks based on UMTS-standards will arrive within the next five years.

"32. The Commission is of the opinion that the technical and economical dynamics of the access network differ from the dynamics of KPN Telecom's core network, which, for example, manifests itself in the depreciation periods and investment levels that KPN currently maintains. The Commission expects this to be also (still) the case in coming years. Therefore, the Commission considers it to be unreasonable to apply the principle of forward-looking elements with regard to the architecture of the access network in determining the tariff for special access to the local line. Investments by KPN for the upgrading of (parts of) the access network may be expressed in a factor (about which more in § 36), with which the tariff for MDF-access is allowed to change."[59]

Additional European Countries

Local loop unbundling is also available in Finland, Denmark,[60] Austria and Germany. The only significant demand in these countries to date has appeared in Germany where over 100,000 voice lines have been provisioned to competitors by DT.

Canada

Canada adopted an essential facilities test for unbundling in 1995, together with an automatic sunset provision set to expire in the year 2000. At the time of adoption, the Canadian CRTC was in a position much like the FCC found itself in 1996 with very little market facts at its disposal. The CRTC's analysis, however, took quite a different turn from the FCC's engineering approach:

59/ OPTA/E 98/21/90, 2 September 1998.

60/ In Denmark, by legislation an entrant can define unbundling requirements and make demands upon the incumbent beyond the local loop. There is no clear demand developing at this point, however.

"73. The Commission considers that either too narrow or too broad a definition of an essential facility may impair the development of competition. If it is too narrow, competitors may not be able to enter the market because of an inability to obtain the necessary network components. If it is too broad, giving overly generous access to ILEC inputs, CLECs may not have sufficient incentives to invest in their own facilities, and would enter and remain in the market primarily as resellers. The Commission is of the view that efficient and effective competition will be best achieved through facilities-based competitive service providers; otherwise, competition will only develop at the retail level, with the ILECs retaining monopoly control of wholesale level distribution.

"74. In light of the above, the Commission concludes that ILECs should generally not be required to make available facilities for which there are alternative sources of supply or which CLECs can reasonably supply on their own. Accordingly, the Commission considers it inappropriate to define an essential facility as a facility that is provided by a dominant firm with market power because it would require facilities to be treated as essential even in the face of the demonstrated feasibility of alternative provision, including self-supply. The Commission concludes that to be essential, a facility, function, or service must meet all three of the following criteria: (1) it is monopoly controlled; (2) a CLEC requires it as an input to provide services; and (3) a CLEC cannot duplicate it economically or technically. Facilities that meet this definition shall be subject to mandatory unbundling and mandated pricing. As well, the tariffed rates for these facilities shall be treated as costs in the imputation test."

With respect to market definition, the CRTC found as follows:

"E. Facilities that are Essential

"81. Parties generally agreed, and the Commission concurs, that the items listed below all meet the definition of essential facility, service or function:-

Central office codes (NXXs);-

Subscriber listings; and-

Local loops in certain bands.
****

"84. The Commission finds that local loops that are situated in small urban and rural areas meet the criteria set out in the Commission's definition of an essential facility. The loops subject to this finding conform to the list of loops that Stentor proposed be essential. In addition, Band B loops in NBTel's territory and Band C loops in MTS' territory are essential.

"85. The Commission notes that, in the other bands, there is competitive supply but it is very limited. In the Commission's view, CLECs would not be able to provide a significant number of loops in these bands in the early stages of competition. The Commission therefore concludes that CLECs must have access to ILEC loops in these bands if they are to compete effectively in the short term. Accordingly, the Commission considers that, while local loops in these bands do not meet the criteria for essential facilities, they should nevertheless be unbundled and priced based on the rating principles for essential facilities. However, as these loops are not essential in accordance with the Commission's definition, ILECs will only be required to cost these loops at Phase II levels rather than at tariffed rates in the imputation test. In Part V below, the Commission has directed the ILECs to file revised demand

estimates based on all companies' demand together with cost studies and rates for such local loops.

"86. The Commission considers it appropriate to apply this modified treatment to local loops in the lower cost bands for a period of five years from the date of this Decision. After this five-year period, these facilities will not be subject to mandatory unbundling or essential facilities rating. In the Commission's view, this approach will permit entry at a pace that will better serve the public interest and, at the same time, provide incentives to CLECs to undertake construction or acquisition of facilities.

****

"3. Local Switching

"90. Several parties argued that local switching is an essential facility, particularly in less populated areas, because new entrants cannot be expected to reproduce immediately Stentor's entire local network. Competitors would not be able to justify the cost of switching equipment installation, housing, climate control, maintenance and operation in such areas.

"91. Stentor submitted that local switching is not essential because there are a number of sources for local switching functionality, including lease from non-Stentor companies or self-supply. Stentor noted that significant evidence has been advanced that many competitors, such as CCTA, Clearnet, Microcell and toll resellers already possess or plan to acquire switching functionality. Stentor noted that CCTA and Microcell are willing to offer this functionality to other entrants.

"92. In response to Sprint's and CCTA's concerns, Stentor argued that new entrants will never have to reproduce Stentor's entire network, but instead can reach minimum efficient scale, one switch at a time, using a variety of widely available modular

switches that can be provisioned in various sizes. Stentor noted that the local market is the same as the toll market in this regard, in that many IX carriers and resellers provide their own switches.

"93. In the Commission's view, the record indicates that switching equipment is readily available, in a wide variety of sizes and configurations, including host/remote or modular arrangements that would allow CLECs to compete with ILECs. In addition, the evidence indicates that a number of potential local competitors already possess switching functionality and that some of these will likely provide this functionality to other CLECs. Accordingly, the Commission finds that local switching is not an essential facility.

"4. Transiting of Traffic

"94. A LEC transits traffic when it receives the traffic from one carrier and switches it to another. Typically, the ILEC would switch traffic from one CLEC to another CLEC, or from a CLEC to an IX carriers or a WSP that is not a CLEC.

"95. CWTA and Microcell argued that the Stentor companies are the only source of transiting facilities and that transiting by ILECs should be considered essential and unbundled. Clearnet argued that, without transiting, CLECs would have to connect directly to all ILEC and CLEC switches. Clearnet argued that ILECs would have little incentive to provide such functionality, and that alternative forms of interconnection would be expensive and economically inefficient.

"96. Stentor stated that transiting functionality comprises switching and local transport services; it stated that neither is an essential facility because any local network provider with switches will be able to provide this functionality. It submitted that CLECs that provide their own switching will have an incentive to provide

transiting service to others once interconnection arrangements are established.

"97. The Commission notes that transiting can be provided by various means. The Commission also notes that, in addition to self-supply, a market is likely to evolve in the provision of transiting, whereby CLECs will offer their transiting capacity to other CLECs in order to increase the utilization and efficiency of their switches. In light of the evidence, the Commission concludes that transiting does not meet the definition of an essential facility or function.

"98. The Commission is nonetheless of the view that, in the early stages of competition, mandatory provision of transiting would accelerate entry into the local exchange market by removing the burden on CLECs of having to provide trunks between themselves and every other CLEC, WSP and IX carriers. Thus, for reasons similar to those set out above in the discussion of local loop treatment in urban areas, the Commission directs ILECs to unbundle the CLEC-to-CLEC, CLEC-to-WSP and CLEC-to-IX carrier transiting function and to provide, for a period of five years from the date of this Decision, transiting services at rates based on the same principles as established in this Decision for essential services. During the same period, for purposes of the imputation test, ILECs will be required to impute transiting services at their Phase II cost rather than at tariff rates.

"99. Given the range of potential transiting arrangements, the Commission will request the CISC to make recommendations as to what arrangements are appropriate. The ILECs will then be required to file transiting tariffs for the arrangements approved by the Commission on the basis set out above.

"5. Signalling Networks

"100. As described earlier in this Decision, CCS7 signalling is required for various call processing functions such as the setting up and taking down of calls and communicating with databases to determine call routing and other functions. The CCS7 system provides for efficient operation of the transmission network and permits the provision of a considerable range of services, such as caller identification, to subscribers.

"101. Several parties stated that the CCS7 signalling network should be unbundled and that the ILECs should be required to provide a transiting service for CCS7 signalling. Otherwise, according to AT&T Canada LDS, CLECs would have to connect directly to every other LEC CCS7 network, which would be cost-prohibitive and an unnecessary and uneconomical duplication of facilities.

"102. Stentor argued that transport capabilities, as well as all of the components that make use of the CCS7 signalling network for the routing of calls, are readily available to CLECs. Stentor also argued that signalling networks are not essential because CLECs can provide their own signalling systems. It noted, for example, that Microcell stated that it already owns STPs capable of switching CCS7 signalling, and that it would be willing to make its network available to other entrants.

"103. With respect to the transiting of CCS7 messages, the Commission notes that there are alternate sources of supply of transport and, as indicated by Microcell's evidence, CLECs can obtain their own STPs. Thus, the Commission considers that, since all components are available to any LEC, neither the CCS7 signalling network nor the CCS7 transiting meets the Commission's definition of an essential function.

"104. However, for the same reasons as those given regarding local traffic transiting and local loops in urban areas, the Commission directs ILECs to provide CLEC-to-CLEC, CLEC-to-WSP and CLEC-to-IX carrier CCS7 transiting and price it on the same basis as essential facilities for a five-year period. Also, as in those cases, ILECs will only be required to cost CCS7 transiting at its Phase II level, rather than at tariff rates in the imputation test.

"105. As with section 4 above, the Commission will request the CISC to make recommendations as to what arrangements are appropriate. The ILECs will then be required to file tariffs for the arrangements approved by the Commission.

"6. Directory Assistance Databases

"106. CCTA, Clearnet, Microcell, MFS and Sprint submitted that access to the Stentor directory assistance (DA) databases should be an essential function or service.

"107. The Commission notes that, in Telecom Order CRTC 96-1522, 23 December 1996 (Order 96-1522), it ordered the Stentor companies to file tariffs for the provision of mediated real-time access (MRTA) by 24 March 1997.

"108. The Commission notes that, as indicated in the section following, CLECs will have access to directory listings, which provide the same information as found in the ILEC DA databases. Therefore, the Commission considers that access to the ILEC DA databases, including MRTA, does not conform to the definition of an essential facility as set out in this Decision.

"7. Directory Assistance

"109. Several parties submitted that DA should be provided to competitors as an essential service.

Stentor argued that all CLECs will be able to purchase Stentor's listings through tariffs filed pursuant to Provision of Directory Database Information and Real-Time Access to Directory Assistance Databases, Telecom Decision CRTC 95-3, 8 March 1995, as amended by Order-in-Council P.C. 1996-1001 and as modified by Order 96-1522 (Decision 95-3 as amended), and provide their own DA service.

"110. In Part XI of this Decision, the Commission finds that the general principles set out in Decision 95-3 as amended, are appropriate for the exchange of subscriber listings by LECs. The Commission considers that this information should also be available for use in providing DA. In addition, CLECs will have MRTA to the ILEC directory database. CLECs therefore will have the ability to provide their own DA service or purchase it from others. The Commission therefore finds that DA is not an essential service in accordance with the Commission's definition.

"8. Directories

"111. CCTA argued that ILEC white page directories are essential and should be available to CLECs in exchange for CLEC directory listing information. Stentor argued that directories are not essential, given the availability of listings and competing directories.

"112. As noted above, the Commission has made subscriber listing information available such that CLECs can produce or acquire directories. Accordingly, the Commission finds that ILEC white page directories do not meet the definition of essential facility."[61]

61/ Telecom Decision CRTC 95-21.

Conclusion

Our studies revealed substantial evidence of competitive facilities-based presence in the local telecommunications market, driven by market forces impacting the largest facilities-based entrants to minimize their costs, ensure the quality of their services, and focus on the facilities they will need for the increasing shift from voice to data, and circuit-switched to packet-switched networks. This analysis documents little need for UNEs beyond local loop unbundling. We have also explained how this evidence is consistent with market developments in other jurisdictions. Finally, this paper has shown that the kind of market evidence presented here, used together with applied economic analysis, constitutes the cornerstone of regulatory policy making throughout major countries of the world.

Regulation not based upon demonstrated market failure would be generally expected to adversely affect investments, the deployment of new services, entry, the development of an effectively competitive marketplace and overall consumer welfare. This is a particularly serious risk in markets characterized by rapid evolution and technology change, such as the U.S. telecommunications marketplace.

A. Brian Savin
Partner

de Fontenay, Savin & Kiss
16 Benjamin Street
Old Greenwich, CT 06870

Subscribed and sworn to before
me this 26 day of May 1999.

Notary Public

My commission expires:

LISA SAMMICHNDRO
A Notary Public of Connecticut
My Commission Expires 6/30/2003

APPENDIX A

Assessment of the Market
Portland, Oregon

Introduction:

The following is a sample of the kind of analysis our research has permitted us to undertake on behalf of New Entrant. This is not a comprehensive survey of all CLEC activities in Portland but displays the underlying basis for our conclusion that New Entrant was capable of executing its business plan exclusively through new carriers.

Demographic Highlights:

The metropolitan area of Portland encompasses three Oregon counties and one county in Washington State.

County	Population (7/1/97)
Multnomah	639,000
Clackamus	313,000
Washington	385,000
Clark (State of Washington)	263,000

The City of Portland is located in Multnomah County and has a population of 503,000.

Portland is an ocean seaport due to the 65-mile Columbia River channel maintained by the Army Corps of Engineers. It has large shipping companies, it's ports have extensive grain and container capabilities, and the Columbia River barges provide access into Eastern Washington and Oregon. The industrial base of the area is very hi-tech. Intel, Hewlett Packard, Sharp Electronics, Fujitsu, Tektronics, Boeing, Freightliner, and Nike are among the larger employers. The great abundance of hydro-electric power and clean water has converted the Portland Region from an economic base that relied upon paper and wood companies such as James River and

Boise Cascade to the newer 1990's semiconductor wafer fabrication and computer peripheral manufacturers.

Economic Centers:

Portland, Oregon Downtown Area: The central city area includes many high rise office buildings, major convention facilities, federal/state/ county government buildings, major medical centers, and a robust retail business base.

High Tech Corridor: 10 miles west of Central Portland is an area of business concentration that includes Nike, Tektronix, Hewlett Packard, and Intel. The two largest cities in this area are Beaverton (63,000) and Hillsboro (52,000).

Airport Area: Located 10 miles northeast of Central Portland along the Columbia River are the major port facilities, package and cargo shippers, hotels, and large retail superstores. Boeing and Fujitsu have large manufacturing facilities located in the area.

Vancouver, Washington: Just across the Columbia River about 12 miles north of Central Portland a technical business base of manufacturers including AVX, S.E.H. America, Sharp Microelectronics, James River Paper, and Boise Cascade.

Incumbent Local Telecom Providers:

US West and GTE serve LATA 672 which includes Portland and all the surrounding economic centers. US West has two tandems, one in Portland and another in Vancouver. GTE's major tandem serves Beaverton and the high tech corridor.

As no local incumbent serves the entire area, there appear to be special opportunities for new carriers to provide packages of area-wide data and/or voice services.

CLEC Providers with fiber rings serving the Region

Two of the CLECS serving Portland, Electric Lightwave and GST Telecom, are headquartered in Vancouver, Washington in Clark County.

Facility-based CLECs with fiber rings serving the Region include:

* Electric Lightwave (largest facilities, 400 local miles of fiber)

* GST Telecom (uses MFS and Enron fiber plus it's own fiber to Vancouver)

* AT&T Local (former TCG Location)

* MCI Worldcom (former MCI Metro, MFS, and Wiltel Locations)

FirstPoint (former Enron Communications local build)

Additional Fiber Routes:

In addition to the backbone networks of AT&T, MCI WorldCom, Williams, and Sprint, new fiber routes connect Portland to Seattle, Spokane, and Boise-Salt Lake. An additional route to San Francisco is under construction. Nedonna Beach on the coast of Oregon is also the landing point for international fiber being built by Project Oxygen and the NorthStar fiber to Alaska. Both pacific fibers will terminate in Downtown Portland.

The new fiber builds have enticed the CLECs and new companies to buy consortium fiber and light their own networks. All of the activity has provided for not only large available bandwidth within Portland but also to the entire West Coast.

Some of the new companies with their own network capability include:

* Qwest
    * ELI
* Level 3
    * GST

* IXC,
* Intermedia.

CLEC ON-Net Buildings:

All of the economic centers of the Portland Region have CLEC fiber serving on-net buildings. We are aware of a sampling of approximately 150 buildings served by CLECs, and we are also aware that various CLECs are currently reporting, collectively, serving several times this amount. The following table provides a sampling of the extent of CLEC on-net coverage:

Economic Center	City	Street
High Tech	Beaverton	Allen Blvd.
High Tech	Beaverton	Compton Dr.
High Tech	Beaverton	Jenkins Rd.
High Tech	Beaverton	Dawson Way
High Tech	Beaverton	Science Park Dr.
High Tech	Beaverton	SW TV Highway
High Tech	Beaverton	Von Neumann
High Tech	Beaverton	SW Industrial Way
High Tech	Beaverton	Nimbus
High Tech	Beaverton	Gemini
High Tech	Beaverton	SW Western
High Tech	Beaverton	Cedar Hills Blvd.
High Tech	Beaverton	SW 153rd Ave
High Tech	Beaverton	SW 141st Ave.
High Tech	Hillsboro	Cornell Road
High Tech	Hillsboro	NE 25th Ave.
High Tech	Hillsboro	Aloclek
High Tech	Hillsboro	Elam Young Parkway
High Tech	Hillsboro	NE Evergreen Parkway
Downtown	Portland	Market
Downtown	Portland	Columbia
Downtown	Portland	Broadway
Downtown	Portland	5th.
Downtown	Portland	6th
Downtown	Portland	Flanders
Downtown	Portland	SW Taylor
Downtown	Portland	SW 4th
Downtown	Portland	SW 3rd
Downtown	Portland	NW 1st.
Downtown	Portland	SW Ankeny St.
Downtown	Portland	SW Morrison St.
Downtown	Portland	SW Salmon
Downtown	Portland	SW 66th. Ave.
Downtown	Portland	NW 21st. St.
Downtown	Portland	NW 19th. St
Downtown	Portland	SW Jefferson
Downtown	Portland	SW Oak St.
Downtown	Portland	NW Everett Ave.
Downtown	Portland	NW Vaughn St.

Downtown	Portland	NW Park Ave.
Downtown	Portland	NW St. Helens Road
Downtown	Portland	Stark Ave.
Downtown	Portland	SW Macadam Ave.
Downtown	Portland	SW Barnes Road
Airport	Portland	NE 78th. Street
Airport	Portland	NE Holiday Street
Airport	Portland	NE Multnomah
Airport	Portland	NE Alderwood
Airport	Portland	NE Columbia Blvd.
Airport	Portland	NE Marx
Airport	Portland	NE 102nd. Ave
Airport	Portland	NE Sandy Blvd.
Airport	Portland	NE 47th. Ave.
Airport	Portland	NE Irving Ave
Airport	Portland	NE Holman St.
Washington State	Vancouver	NE Parkway Dr.
Washington State	Vancouver	NE 41st. St.
Washington State	Vancouver	NE Greenwood Drive
Washington State	Vancouver	W 8th Street
Washington State	Vancouver	NE Mother Joseph Dr.
Washington State	Vancouver	NE 120th. Street
Washington State	Vancouver	SE 34th. Street
Washington State	Vancouver	SE McGillvray Streeet
Washington State	Vancouver	NE 4th. Plain Ave.
Washington State	Vancouver	Thurston Way
Washington State	Vancouver	NE Mill Plain

CLEC Central Office Collocations:

CLECs have collocated in the following central offices of the incumbent local companies, which factor alone provides them with extensive coverage capabilities in the Portland area:

Hi Tech Center	GTE Collocation	Aloha Central Office
Hi Tech Center	GTE Collocation	Beaverton

Central Portland	US West	Belmont C.O. SE Morrison
Central	US West	Portor12 NE 24th St (TBD)
Central	US West	Capital C.O. SW Stark
Central	US West	Cherry C.O. SW Capitol Hill
Airport	US West	Butler C.O. N. Lombard
Airport	US West	Alpine C.O. NE 102nd Ave
Vancouver	US West	Orchards C.O. 4th. Plain

Data and Voice Switches serving Portland:

Provider	Voice	Data	Using LEC Switch
AGIS	NO	Cascade	NO
Frontier	Yes	ATM	NO
Level 3	NO	Backhaul Data	NO
GST	Nortel	ATM / DARPA	NO
Intermedia	NO	ATM / OC-3 transport	NO
Electric Lightwave	Nortel	ATM	NO
Enron Comm.	NO	ATM/Video	NO
IXC	Nortel (Alcatel)	Backhaul Data	NO
Qwest	NO	Backhaul ATM	NO
Williams	Yes	Backhaul Data	NO
AT&T	Lucent	ATM	NO
MCI Worldcom	Yes	ATM	NO
Great West Services	NO	Data Switching	NO
Northpoint	NO	DSL	NO
Covad	NO	DSL	NO
Rhythm	NO	DSL	NO

Teligent	In Process	ATM	NO
Sprint	Yes	ATM	NO

In addition, we are aware of two companies prepared to install DMS 500 switches in their existing POP locations should there be demand requested for voice services.

This fiber rich environment has attracted many telecom providers. ELI, GST, Qwest, and others compete aggressively to provide wholesale services to new entrants. It is possible to collocate or purchase facility space in downtown Portland and have multiple providers of network capacity serve such a site on either a permanent or temporary basis. ELI and GST serve the three tandems (USW Main, USW Orchards for Vancouver, GTE Beaverton) and provide inter-office transport to many of the larger central offices.

The survey of Portland indicated that there was sufficient voice and data switching available that no carrier is using a LEC switch via resale or Unbundled Network Element.